

Amendments to the Claims

Claim 1 (Previously amended): Seed of maize inbred line designated PH581, representative seed of said line having been deposited under ATCC Accession No. PTA-4432.

Claim 2 (Canceled)

Claims 4-10 (Canceled)

Claims 15-16 (Canceled)

Claim 21 (Canceled)

Claims 23-29 (Canceled)

Claims 37-43 (Canceled)

Claims 50-57 (Canceled)

Claim 58 (New): A maize plant, or a part thereof, produced by growing the seed of claim 1.

Claim 59 (New): The maize plant of claim 58 wherein said plant has been detasseled.

Claim 60 (New): A tissue culture of regenerable cells produced from the plant of claim 58.

Claim 61 (New): Protoplasts produced from the tissue culture of claim 60.

Claim 62 (New): The tissue culture produced from the plant of claim 58, wherein cells of the tissue culture are from a tissue selected from the group consisting of leaf, pollen, embryo, root, root tip, anther, silk, flower, kernel, ear, cob, husk and stalk.

Claim 63 (New): A maize plant regenerated from the tissue culture of claim 60, wherein said plant is capable of expressing all the morphological and physiological characteristics of inbred line PH581, representative seed of said line having been deposited under ATCC Accession No. PTA-4432.

- Claim 64 (New): A method for producing an F1 hybrid maize seed, comprising crossing the plant of claim 58 with a different maize plant and harvesting the resultant F1 hybrid maize seed.
- Claim 65 (New): A method of producing a male sterile maize plant comprising transforming the maize plant of claim 58 with a nucleic acid molecule that confers male sterility.
- Claim 66 (New): A male sterile maize plant produced by the method of claim 65.
- Claim 67 (New): A method of producing an herbicide resistant maize plant comprising transforming the maize plant of claim 58 with a transgene that confers herbicide resistance.
- Claim 68 (New): An herbicide resistant maize plant produced by the method of claim 67.
- Claim 69 (New): The maize plant of claim 68, wherein the transgene confers resistance to an herbicide selected from the group consisting of: imidazolinone, sulfonylurea, glyphosate, glufosinate, L-phosphinothricin, triazine and benzonitrile.
- Claim 70 (New): A method of producing an insect resistant maize plant comprising transforming the maize plant of claim 58 with a transgene that confers insect resistance.
- Claim 71 (New): An insect resistant maize plant produced by the method of claim 70.
- Claim 72 (New): The maize plant of claim 71, wherein the transgene comprises a transgene encoding a *Bacillus thuringiensis* endotoxin.
- Claim 73 (New): A method of producing a disease resistant maize plant comprising transforming the maize plant of claim 58 with a transgene that confers disease resistance.
- Claim 74 (New): A disease resistant maize plant produced by the method of claim 73.

Claim 75 (New): A method of producing a maize plant with decreased phytate content comprising transforming the maize plant of claim 58 with a transgene encoding phytase.

Claim 76 (New): A maize plant with decreased phytate content produced by the method of claim 75.

Claim 77 (New): A method of producing a maize plant with modified fatty acid metabolism or modified carbohydrate metabolism comprising transforming the maize plant of claim 58 with a transgene encoding a protein selected from the group consisting of stearyl-ACP desaturase, fructosyltransferase, levansucrase, alpha-amylase, invertase and starch branching enzyme.

Claim 78 (New): A maize plant produced by the method of claim 77.

Claim 79 (New): The maize plant of claim 78 wherein the transgene confers a trait selected from the group consisting of waxy starch and increased amylose starch.

Claim 80 (New): A maize plant, or part thereof, capable of expressing all the physiological and morphological characteristics of the inbred line PH581, representative seed of said line having been deposited under ATCC Accession No. PTA-4432.

Claim 81 (New): A method of introducing a desired trait into maize inbred line PH581 comprising:

(a) crossing the PH581 plants, grown from seed deposited under ATCC Accession No. PTA-4432, with plants of another maize line that comprise a desired trait to produce F1 progeny plants, wherein the desired trait is selected from the group consisting of male sterility, herbicide resistance, insect resistance, disease resistance, modified fatty acid metabolism, modified phytic acid metabolism, and modified carbohydrate metabolism;

(b) selecting F1 progeny plants that have the desired trait to produce selected F1 progeny plants;

(c) crossing the selected F1 progeny plants with the PH581 plants to produce first backcross progeny plants;

(d) selecting for first backcross progeny plants that have the desired trait and physiological and morphological characteristics of maize inbred line PH581 listed in Table 1 to produce selected first backcross progeny plants; and

(e) repeating the steps of backcrossing to PH581 three or more times in succession to produce selected fourth or higher backcross progeny plants that comprise the desired trait and all of the physiological and morphological characteristics of maize inbred line PH581 listed in Table 1 as determined at a 5% significance level when grown in the same environmental conditions.

Claim 82 (New): A plant produced by the method of claim 81, wherein the plant has the desired trait and all of the physiological and morphological characteristics of maize inbred line PH581 listed in Table 1 as determined at a 5% significance level when grown in the same environmental conditions.

Claim 83 (New): The plant of claim 82 wherein the desired trait is herbicide resistance and the resistance is conferred to an herbicide selected from the group consisting of: imidazolinone, sulfonylurea, glyphosate, glufosinate, L-phosphinothricin, triazine and benzonitrile.

Claim 84 (New): The plant of claim 82 wherein the desired trait is insect resistance and the insect resistance is conferred by a transgene encoding a *Bacillus thuringiensis* endotoxin.

Claim 85 (New): The plant of claim 82 wherein the desired trait is male sterility and the trait is conferred by a cytoplasmic nucleic acid molecule that confers male sterility.

Claim 86 (New): The plant of claim 82 wherein the desired trait is decreased phytate content and the trait is conferred by a transgene encoding phytase.

Claim 87 (New): The plant of claim 82 wherein the desired trait is modified fatty acid metabolism or modified carbohydrate metabolism and the trait is conferred by a transgene encoding a protein selected from the group consisting of stearyl-ACP desaturase, fructosyltransferase, levansucrase, alpha-amylase, invertase and starch branching enzyme.